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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674,038	09/29/2003	J. Rodney Walton	030421	2588
23696	7590	10/20/2004	EXAMINER	
Qualcomm Incorporated Patents Department 5775 Morehouse Drive San Diego, CA 92121-1714			GEORGE, KEITH M	
			ART UNIT	PAPER NUMBER
			2663	

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/674,038	<b>Applicant(s)</b> WALTON ET AL.	
	<b>Examiner</b> Keith M. George	<b>Art Unit</b> 2663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-52 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-52 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-52 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claim 1 recites the limitation "each pair of data symbols" in line 9 of the claim. There is insufficient antecedent basis for this limitation in the claim. Claims 2-16 are similarly rejected.
4. Claim 17 recites the limitation "each pair of data symbols" in line 9 of the claim. There is insufficient antecedent basis for this limitation in the claim. Claims 18-21 are similarly rejected.
5. Claim 22 recites the limitation "each pair of data symbols" in line 9 of the claim. There is insufficient antecedent basis for this limitation in the claim. Claims 23-26 are similarly rejected.
6. Claim 27 recites the limitation "each pair of data symbols" in line 8 of the claim. There is insufficient antecedent basis for this limitation in the claim. Claims 28-31 are similarly rejected.
7. Claim 32 recites the limitation "each pair of data symbols" in line 9 of the claim. There is insufficient antecedent basis for this limitation in the claim. Claims 33-35 are similarly rejected.

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8. Claim 36 recites the limitation "each pair of vectors" in line 6 of the claim. There is insufficient antecedent basis for this limitation in the claim. Claims 37-42 are similarly rejected.

9. Claim 43 recites the limitation "each pair of vectors" in line 4 of the claim. There is insufficient antecedent basis for this limitation in the claim. Claims 44-47 are similarly rejected.

10. Claim 48 recites the limitation "each pair of vectors" in line 5 of the claim. There is insufficient antecedent basis for this limitation in the claim. Claims 49-52 are similarly rejected.

***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims 1, 17, 22, 27, 32, 36, 43 and 48 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhuang et al., U.S. Patent Publication 2003/0112745, hereinafter Zhuang.

13. Referring to claims 1, 17, 22, 27 and 32, Zhuang teaches an invention that provides a method of operating a coded OFDM communication system (coding traffic data) by interleaving a plurality of encoder output bits (interleaving the coded data); mapping the interleaved bits to a plurality of modulated symbols (symbol mapping the interleaved data); and forming a set of OFDM symbols for a plurality of transmit antennas (processing each pair of data symbols in the stream to obtain two pairs of transmit symbols for transmission from a pair of antennas) based on the modulated symbols (each transmit symbol is a version of a data symbol) (abstract).

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14. Referring to claims 36, 43 and 48, Zhuang teaches in figure 3 a plurality of receivers with a plurality of antennas receiving a plurality of signals (obtaining a stream of vectors of received symbols). A receive array processor which can perform receive array combining for the purposes of exploiting receive diversity and/or suppressing interference via one of many receive antenna array processing techniques (processing each pair of vectors of received symbols in the stream). The receive array processor may produce array processor output symbols that may be used to compute symbol metrics and then to generate bit metrics (symbol demapping the stream). The bit metrics can be de-interleaved according to the specific interleaving pattern (deinterleaving the demodulated data). The BICM decoder within one embodiment of the invention may employ a Viterbi decoder for a convolutional code. The Viterbi decoder computes the metric for each branch in the code trellis and accumulates branch metrics along the paths in the trellis. Each branch metric is the sum of bit metrics of those bits associated with the branch (decoding the deinterleaved data) (pages 2-3, paragraph [0025] and figure 3).

#### ***Allowable Subject Matter***

15. Claims 2-16, 18-21, 23-26, 28-31, 33-35, 37-42, 44-47 and 49-52 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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a. Lee et al., U.S. Patent Application Publication 2003/0060173, teaches that generally, transmission bits are grouped into a transport block of a predetermined size as an encoder input unit in a higher layer. An encoder encodes a transport block and outputs systematic bits and parity bits. An interleaver interleaves the sequence of the coded bits in a predetermined rule. The interleaver output is processed appropriately according to a transmission scheme such as CDMA, FDM or OFDM. Then the resulting radio signal is transmitted through an antenna.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Keith M. George whose telephone number is 571-272-3099. The examiner can normally be reached on M-Th 7:00-4:30, alternate F 7:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau T. Nguyen can be reached on 571-272-3126. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Keith M. George  
15 October 2004



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10/18/04